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THE PROGRESS OF SCIENCE

*RAPHAEL PUMPELLY'S
REMINISCENCES*

RAPHAEL PUMPELLY, distinguished as an explorer and geologist, has at the age of eighty-one years put through the press his reminiscences, well printed and illustrated, by Henry Holt and Company. It is an entertaining book, telling of many adventures in strange lands under conditions which no longer exist.

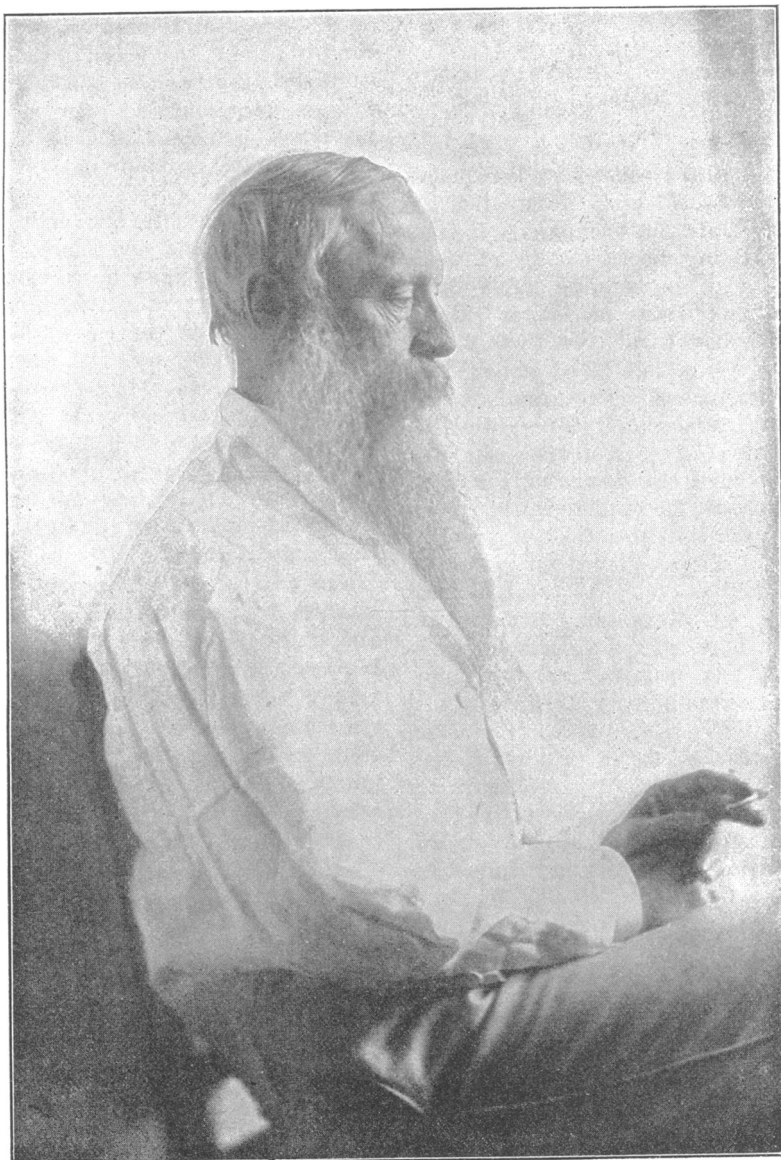
Even in central New York a child eighty years ago lived under frontier conditions. The family owned forests, farms and stores; the Susquehanna River and later the Erie Canal were the means of communication with the outside world. Pumpelly was sent to school in preparation for Yale College, but persuaded his mother to take him abroad, where in Germany, France and Italy there was a charm in travel which has largely vanished under modern conditions. The changes in Germany, for example, have been almost as great as in central New York and in Arizona. Then the cities were still medieval in character, grass grew in the streets, sanitation was lacking, industries were carried on chiefly by individual handicrafts, the people were simple and kindly.

Pumpelly's most exciting adventures were in Corsica, where he lived with the mountain people and became interested in geology. At Vienna he by chance attended a meeting of the German Association of Scientific Men, corresponding to our American Association for the Advancement of Science, and casually made the acquaintance of Professor Noeggerath, the Bonn geologist, who advised him to study at the Mining Academy at Freiburg in Saxony, where he spent three years.

On returning to America, after an absence of six years, Pumpelly went to Arizona to develop silver mines

in the Santa Rita Mountains. The conditions in the desert with its Indians, Mexicans and outlaws seem almost incredible and were reduced to chaos by the removal of the United States soldiers at the outbreak of the Civil War. After countless adventures, Pumpelly made his way over the Old Yuma Trail to California. There he received an appointment to enter the Japanese service and had the advantage of intimate acquaintance with the country and its people when it was first opened to the outside world. He explored the mines and introduced the use of gun powder in blasting, but the anti-foreign party forced the Yeddo Government to cancel its contracts and Pumpelly went to China. There he received an imperial commission to examine the coal fields and had all sorts of adventures in regions practically unexplored and among natives to whom foreigners were almost unknown. Everywhere Pumpelly appears to have formed kindly relations with all sorts and conditions of people. He finally crossed Siberia and returned to New York at the age of twenty-eight.

Pumpelly accepted in 1866 a chair of mining geology at Harvard which he held for nine years. His first class consisted of William Morris Davis, Henry Gannett and Archibald Marvin. But he only spent a limited amount of time at Cambridge, being engaged in many enterprises and living in many places. He was on the U. S. Geological Survey, state geologist of Michigan and Missouri, and director of the Northern Transcontinental Survey. He was vice-president of the International Geological Congress, held in Washington in 1891. An illustration is here reproduced (by the courtesy of Henry Holt and Company to whom we are also indebted for permission to reprint the portrait of Pumpelly)



RAPHAEL PUMPELLE, 1900
From a photograph by Elise Pumpelly Cabot

showing four distinguished directors of foreign geological surveys, together with Dr. Van Hise and the author, on an excursion which followed the congress. But all these things are passed over lightly in the book. Pumpelly was most happy in his married life and had innumerable friends among scientific men and men distinguished in other directions; but he likes best to describe adventures among strange peoples.

This he does again toward the close of the book, for at the age of nearly seventy he conducted an expedition into Central Asia for the Carnegie Institution accompanied by his son, and with the cooperation of Professor W. M. Davis and Professor Ellsworth Huntington. They made important discoveries concerning prehistoric civilizations and geological and climatic changes. The next to last chapter tells of revisiting the Arizona desert in 1915. The final chapter discusses ancestry, heredity and environment.

THE USE OF ASPHYXIATING GAS

THE British Ministry of Information, according to the *British Medical Journal*, recently issued a communication relating to a statement sent out by the official German wireless to the effect that the idea of using poison gas in warfare originated with the British Admiral Lord Dundonald, better known to fame as Lord Cochrane. It is a matter of history that in 1812 Dundonald submitted to the Prince Regent, afterwards George IV., secret war plans which included the use of an asphyxiating gas. A committee of experts to whom this proposal was referred expressed the opinion that the mode of attack was "infallible and irresistible," but it was not sanctioned. In 1840, when there was a threat of war with France, Dundonald again submitted his plan to the British Government and offered by means of it to annihilate the French fleet.

The Duke of Wellington thought well of the idea, but with his practical good sense pointed out that "two could play at that game," a fact which the Germans have learnt to their cost. In 1846 the plans were again referred to a committee, which reported that it was not desirable that any experiment should be made on the ground that part of the plans "would not accord with the principles of civilized warfare." Later, when again there was talk of war, Dundonald was asked about his plan, but once more it was rejected, the only objection to it being that it was "too terrible for use by a civilized community." Dundonald's account of the plan is given in the correspondence of Lord Panmure, who was War Minister during the Crimean War. In a memorial dated August 7, 1855, he states that when viewing some sulphur kilns in 1811 he observed that the fumes which escaped in the rude process of extracting the material, though first elevated by heat, soon fell to the ground, destroying all vegetation and endangering animal life to a great distance. With reference to the materials required for the expulsion of the Russians from Sebastopol, experimental trials had, he said, shown that about five parts of coke effectually vaporize one part of sulphur. Four or five hundred tons of sulphur and two thousand tons of coke would be sufficient. Besides these materials it would be necessary to have as much bituminous coal and a couple of thousand barrels of gas or other tar for the purpose of masking the fortifications to be attacked, with dry firewood to kindle the fires, which ought to be kept in readiness for the first favorable and steady breeze. Dundonald offered to direct the application of the plan himself, but the proposal was rejected. The use of asphyxiating gas is a very ancient device. Smoking out the enemy was one of the regular manoeuvres of war in antiquity. Polybius relates